EXHIBIT G
PART 3 OF 6

REDACTED VERSION OF DOCUMENT SOUGHT TO BE SEALED

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_____ ."[204] Thus, Dr. Leonard's opinion that Google's infringement has not impacted the feature phone market and corresponding Java ME revenue is unreliable in that it lacks consideration of the overall market in which Android participates.

176. Dr. Leonard also improperly critiques my consideration of an alternate Java ME forecast from an October 2008 Sun presentation, "Java in Wireless Business Review."[205] To clarify, I did not offer an alternate lost profits opinion based on the "Best Estimate" forecast found in this presentation. Rather, I reviewed the "Best Estimate" forecast to confirm the reasonableness of the growth rate assumption in my Java ME lost profits calculation. In critiquing my reference to the "Best Estimate," Dr. Leonard believes "there is no need to calculate and use a 2009 to 2010 growth rate" since there were forecasted revenues available for 2009-2012.[206] However, what Dr. Leonard fails to consider is that forecasts included in this document are encumbered by the existence of Android, and therefore do not represent an accurate picture of Sun's marketplace opportunities - absent the impact of Android in the "but-for" world. To that point, I note the "Best Estimate" forecast specifically states _____

_____ [207] I also note that all four of the projections included in the presentation reflect the negative effect of Android on Java ME revenue, to varying degrees. Since Sun was aware that the impact of Android would result in losses once its licenses transitioned to Android, it projected greater losses for 2010-2012 (when licenses began coming up for renewal). This understanding is consistent with Sun's projection of growth in 2009 and 2010, and a decline thereafter. Therefore, while I reviewed this document to determine that my chosen growth rate was lower than the growth rate of a model that reflected the impact of Google's infringement, I did not endorse this model as a basis for the determination of lost profits.

177. Despite Dr. Leonard's improper use of the "Best Estimate," he relies on the document to perform two alternate lost profit calculations.[208] Both of those calculations are unreliable because they rely on an Android tainted source document, and it is not possible to capture the losses attributable to Android when you start with a projection that has already been reduced by the impact of Android.

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[204] OAGOOGLE0006231006-033 at 025; OAGOOGLE0000473609-612; OAGOOGLE0000424812-813 at 812.

[205] OAGOOGLE0000142142; Expert Report of Dr. Leonard, February 8, 2016, pp. 137-138.

[206] Expert Report of Dr. Leonard, February 8, 2016, p. 138.

[207] OAGOOGLE0000142142 at slide 28.

[208] It is unclear why Dr. Leonard proposes a calculation which limits damages to only CLDC. I am aware that there was an order issues by the Court on February 5, 2016 in which the Court limited the case to exclude new Android lines of business that did not exist at the time of the initial trial. This order does not impact my determination of lost profits in this case because it relies on Java's historical businesses. Similarly, I primarily rely on the same documents and methods employed by the experts at the time of the initial trial and have not altered the assumptions made to reflect Android's new products which the Court addressed in its order.

5.2   Dr. Leonard's Alternative Lost Profits Opinions Are Speculative and Unreliable

178.   Despite claiming Oracle's lost profits are zero, Dr. Leonard puts forth two alternative Java ME lost profit calculations.[209] My comments regarding Dr. Leonard's alternative calculations are detailed throughout this section, and can be summarized as follows:

- The underlying basis for Dr. Leonard's calculation is improper
- Dr. Leonard's reconstructed market is speculative
- Dr. Leonard's conversion of market share to "revenue capture" is misleading
- Dr. Leonard's diversion ratio is unfounded and misleading

179.   Dr. Leonard states he "adjusted Mr. Malackowski's calculation by starting with Oracle's actual Java ME licensing revenues, and asking what effect Android had on those revenues under conservative assumptions…"[210] However, Dr. Leonard does not "adjust" my analysis. Rather, he performs an entirely different analysis that suffers from several deficiencies.

180.   First, Dr. Leonard's starting point of Oracle's actual Java ME licensing revenues is inappropriate because the revenues he relies on are already reduced due to Google's illegal use of the Infringed Java Copyrights. Thus, by basing his alternative lost profit calculations on an already reduced revenue stream, Dr. Leonard's analysis significantly understates Sun's losses.

181.   Next, Dr. Leonard calculates the "potential Java ME licensed handsets" by creating a "but-for" market whereby Sun's market share is recalculated to incorporate infringing units absent infringement. Such an approach – typically referred to as a "Mor-Flo" analysis in connection with patent infringement actions – is inappropriate in this copyright infringement matter as it requires recreating an emerging smartphone market, absent Google's infringement. Given the transformation of the mobile industry throughout the damages period, any attempt to recreate the market absent Android's infringement would be highly speculative. In fact, since Android was released at the same time as the smartphone shift, there does not exist an accurate representation of the smartphone market absent Android's infringing impacts.

182.   Dr. Leonard next deducts Android units to arrive at "non-Android handsets," before reducing that amount by the number of iPhone units to arrive at "Potential Java ME Licensed Handsets".[211] Without expressly saying so, by removing iPhone units Dr. Leonard's analysis implicitly assumes iOS would be the only economic substitute for Android through 2015. Such an assumption fails to consider the potential that an additional competitor such as RIM, Nokia, Microsoft and/or Sun could have emerged in Android's absence. This speculative assumption runs contrary to factual evidence showing RIM, Nokia, Microsoft and Sun as market leaders prior to the introduction of Android. It is also improperly suggesting that numerous third parties that are now associated with

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[209] Expert Report of Dr. Leonard, February 8, 2016, pp. 139-140.
[210] Expert Report of Dr. Leonard, February 8, 2016, p. 139.
[211] Exhibit 4f to the Expert Report of Dr. Leonard, February 8, 2016.

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Android (e.g. OEMs, app developers, etc.) would not have been ready, willing and able to align with a (non-Android) provider of a non-iOS mobile platform.

183.   In addition to these flaws in Dr. Leonard's "potential Java ME licensed handsets" calculations, reviewing the next steps in his lost profits analysis reveals additional flaws. Dr. Leonard subsequently uses the previously discussed calculations to determine the "Potential Java ME Market Share" by dividing the "Potential Java ME Licensed Handsets" (which improperly exclude iPhone units as discussed previously) by "Non-Android Handsets".[212] Rather than using Sun's actual market share and extrapolating the additional units it would have captured in the "but-for" world as is typically done in Mor-Flo analyses, Dr. Leonard improperly recalculates an alternative market share. In doing so, Dr. Leonard ignores the possibility that Sun could have maintained its market dominance, ██
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184.   Next, Dr. Leonard determines a "but-for Java ME Revenue Capture Rate" by multiplying the "Potential Java ME Market Share" by "Android Handsets" and dividing the product by the "Potential Java ME Licensed Handsets".[214] This calculation is not a revenue capture rate, despite Dr. Leonard calling it that. In fact, this is the additional unit market share of what Dr. Leonard believes are the total possible Java ME units. Applying this unit market share increase to Java's damaged actual revenues, is meaningless, because they do not represent or reflect that value of total possible Java ME units. Therefore, he has misapplied his so called "revenue capture rate" to an inappropriate revenue stream rendering the results meaningless.

185.   I note, Dr. Leonard does not alter my approach to incremental expenses. In fact, he does not discuss incremental expenses aside from deducting them in his lost profits calculations. The calculations described above result in Dr. Leonard's opinion that Java ME lost profits equal $128.5 million[215]

186.   In addition to his $128.5 million lost profits analysis, Dr. Leonard offers a second alternative calculation of Java ME lost profits. This second approach begins with the same methodology as his first alternative, but Dr. Leonard performs an additional iPhone based adjustment to the "but-for" market based on what he refers to as a "diversion ratio." The result of Dr. Leonard's second alternative calculation is $85.7 million,[216] and my comments regarding the "diversion ratio" upon which Dr. Leonard has inappropriately relied to perform his second alternative calculation are detailed in Sections 4.2-.4.4 of this report.

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[212] Exhibit 4f to the Expert Report of Dr. Leonard, February 8, 2016.

[213] Exhibit 1390 to Deposition of Alan Brenner, OAGOOGLE0013561757-786 at 759.

[214] Exhibit 4f to the Expert Report of Dr. Leonard, February 8, 2016.

[215] Expert Report of Dr. Leonard, February 8, 2016, p. 140; Exhibit 4e and 4f to the Expert Report of Dr. Leonard, February 8, 2016.

[216] Expert Report of Dr. Leonard, February 8, 2016, p. 140.

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5.3 Dr. Leonard Improperly Compares Lost Profits to Sun/Google Negotiations

187. Dr. Leonard inappropriately states his alternative lost profit calculations are "more consistent with both Sun's initial proposal to Google, and the parties' final negotiating positions, during the Sun-Google negotiations in 2005 and 2006 regarding a possible collaboration between the two companies to develop a Java-language based mobile platform".[217] Using offers made in an unsuccessful negotiation to support a lost profits opinion is inappropriate. A major aspect of the negotiations was Sun's insistence that Google use a compliant version of Java such that Sun would be able to continue to expand and grow its Java business. Thus, a major reason the negotiations failed is because the parties could not agree on this issue, or on the appropriate level of compensation for a Google intended non-compliant use of Java.

5.4 Java Was Not Stagnant When Google Chose to Adopt it for Use with Android and it is Not Stagnant Now

188. Dr. Leonard claims Java was stagnant prior to the introduction of Android and that Java ME revenue declined as a result of this ongoing problem, and not due to Google's infringement of the Java Copyrights. However, Dr. Leonard's opinion ignores that, at the time of Google's first infringement of the Java Copyrights, Java was the leading applications platform and its developer community was continuing to grow. ██████████████████████████████ ██"[218] As discussed in my Initial Report, in 2006 there were six million Java developers and by 2010 the Java development community had grown to nine million members.[219] ████████████████████ ██████████████████████████████.[220] █████████████ ████████████████████████████[221] Had Java been "stagnant," as Dr. Leonard alleges, it is unlikely that the number of Java developers and Java enabled phones would have grown by such amounts over those time periods. Furthermore, as seen in the following Figure 7, over the period 2002 – 2016, Java's developer community rating has consistently remained ahead of most, if not all, if its competition.

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[217] Expert Report of Dr. Leonard, February 8, 2016, p. 141.
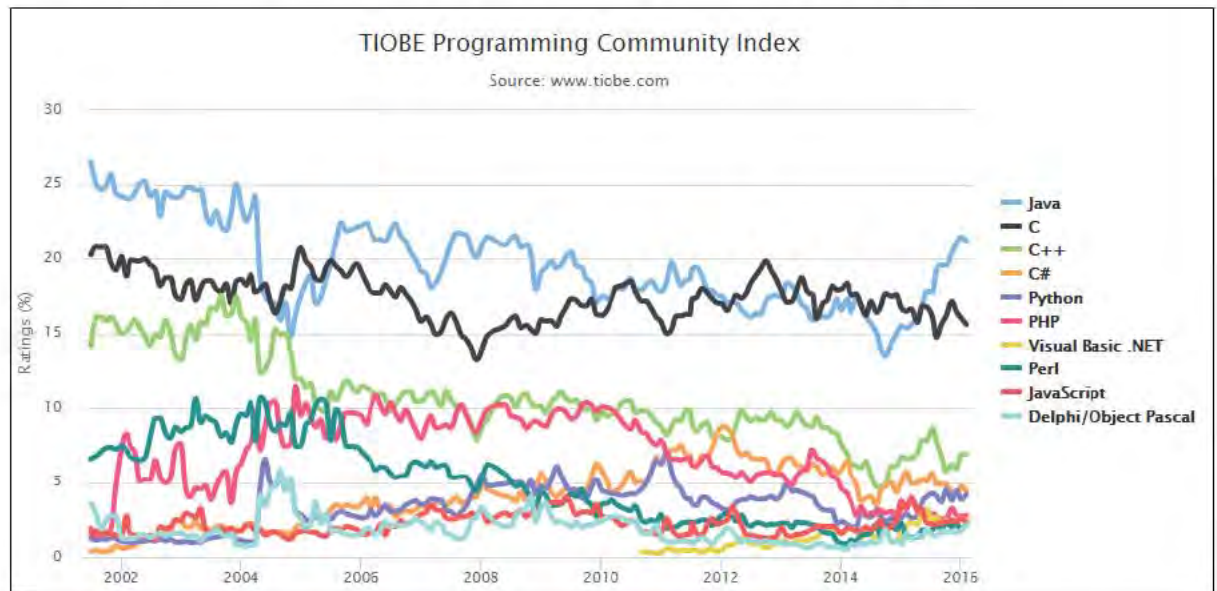[218] Deposition of Alan Brenner, December 15, 2015, pp. 75-76.
[219] OAGOOGLE0013122655-718 at 656.
[220] OAGOOGLE0000061924-2030 at 1954.
[221] OAGOOGLE0013122655-718 at 662.

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Figure 7

Historical Summary of Java Programming Community Ratings [222]

TIOBE Programming Community Index
Source: www.tiobe.com

189. Google's use of Java in Android further supports an assertion that Java ME revenue did not decline due to lack of Java viability for a mobile platform. In a January 2006 internal Google email chain, Mr. Brian Swetland stated: "Java is more accessible than C++. There are more Java programmers. There is more standardization in tools and libraries. Debugging is much simpler."[223] Additionally, Mr. Rubin stated in an email in April 2006 that: "We will ship a more stable product sooner if we do as much as possible in Java."[224] In a March 2006 Google Monetization Proposal to Sun, Google states "Our goal is to create a branded open handset platform which has an implied conformant level of functionality and APIs…Sun could play a significant role in that conformance and branding process."[225] Similarly, in a November 2006 Google presentation to T-Mobile regarding its wireless partnership, Google stated: "Supporting Java [ME] is the best way to harness developers…Linux fragmentation threatens market acceptance. Tools and new app frameworks are biggest hurdles. 6M Java developers worldwide. Tools and documentation exist to support app development without the need to create a large developer services organization. There exist many legacy Java applications. The wireless industry has adopted Java, and the carriers require its support."[226]

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[222] http://www.tiobe.com/index.php/content/paperinfo/tpci/index.html

[223] GOOGLE-01-00019511-513 at 512.

[224] GOOGLE-01-00075935-936 at 935.

[225] Trial Exhibit 11, p. 4.

[226] Trial Exhibit 387, p. 40

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190. In addition to Dr. Leonard's misguided assertion that Java was stagnant, he also inappropriately points to "security problems" with Java.[227] Much of the support for this inappropriate assertion relates to desktop computers and issues in the 2012 to 2013 time frame.[228] While this time frame is years after the infringement began, Dr. Leonard neglects to discuss the security issues with Android itself and the vulnerabilities across many programming languages.[229] There is no evidence that security issues were any different in the "but for" vs. actual world and therefore would not be the cause of the shortfall in the actual world.

191. Dr. Leonard also improperly argues Sun's licensing practices caused "the Java Platform to be fragmented"[230], however this assertion disregards Sun's attempts to maintain control of Java and the continued success of the platform. Dr. Leonard improperly states that Sun's TCK left room for incompatibility, when in fact part of the reason for implementing the TCK was to reduce fragmentation.[231] Dr. Leonard also asserts Sun's license with DoCoMo "is a good example of how it created fragmentation"[232] however his only citation for this argument is a reference to a conversation with John Rizzo. Thus Dr. Leonard inappropriately makes this assertion without even citing the actual license agreement, or any other evidence in this matter. ▮

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5.5   The Limited Impact of the Recession on the Mobile Phone Industry

192. Dr. Leonard opines that the financial crisis of 2008 "was a cause of the failure of JavaFX Mobile as well as a decline in Sun's revenues generally, likely was another contributory factor to the decrease in Java ME licensing revenues that had nothing to do with Android."[235] To support this opinion, Dr. Leonard looks to Sun's Systems Group, (which consists of "Server Products" and "Storage Products" and Java licensing revenues) which experienced a decrease in revenue of -1.7% in FY 2008 and -22.2% in FY 2009.[236] However, Dr. Leonard does not link the declining Systems Group revenue directly to Java ME beyond simply noting that Java ME is reported under Sun's Systems

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[227] Expert Report of Dr. Leonard, February 8, 2016, pp. 125-128.

[228] Expert Report of Dr. Leonard, February 8, 2016, pp. 125-128. http://arstechnica.com/security/2013/01/critical-java-vulnerabilies-confirmed-in-latest-version/.

[229] http://www.zdnet.com/article/android-you-have-serious-security-problems/.

[230] Expert Report of Dr. Leonard, February 8, 2016, pp. 107-111.

[231] Deposition of Vineet Gupta, July 26, 2011, pp. 175-179.

[232] Expert Report of Dr. Leonard, February 8, 2016, p. 109.

[233] OAGOOGLE0017187388.

[234] OAGOOGLE0012956691-693 at 692 -693.

[235] Expert Report of Dr. Leonard, February 8, 2016, p. 124.

[236] Expert Report of Dr. Leonard, February 8, 2016, p. 124.

Group. Comparing Java ME revenue to the total revenue for the Systems Group reported in the annual report, Dr. Leonard indicates that Java ME revenue represented ▮% of Sun's Systems Group in 2008 and ▮% in 2009.[237] As evidenced by these calculations, Java ME is a small portion of the Systems Group and thus the overall Systems Group financial performance is not representative of Java ME specifically. Furthermore, in its 2009 Form 10-K, Sun attributed the decline in its Systems Group to "the weakness in demand for high-end servers" and "aggressive discounting with respect to our tape and enterprise disc array products."[238]

193. Although certain aspects of Sun's business declined as a result of the recession, it should be noted that a material portion of Sun's revenue was generated through the sale of servers, primarily to large financial institutions. In 2009, more than 25% of Sun's overall revenue resulted from the sale of servers[239] and, because many large financial institutions were negatively impacted by the financial crisis, Sun's sales of servers declined rapidly.[240] As a result of the financial crisis, Sun re-organized its software business group in addition to cutting costs in hopes of improving its profit margins.[241] Notably, Sun's 2009 Form 10-K also describes the introduction of the JavaFX Mobile Platform as one of the "cornerstones of [our] business strategy."[242]

194. While the financial crisis significantly impacted the economy, consumers' growing use of mobile data on increasingly complex mobile devices set the stage for the mobile industry, and Sun's related business, to minimize the impact of the recession. This is reflected in the following excerpts taken from analyst reports:

- The Economist stated: *"Despite the recession, the mobile industry is enjoying a promising transformation."*[243]

- Infonetics Research stated: *Bucking the general trend, smartphones are expected to out-perform the downturn and show modest growth in 2009, and will be the only mobile phone segment to maintain annual revenue growth over the next five years, and the only to post double-digit annual revenue growth from 2011 to 2013."*[244]

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[237] OAGOOGLE0100167800; Sun Microsystems, 2009 Annual Report, June 30, 2009, p. 90.

[238] Sun Microsystems, 2009 Annual Report, June 30, 2009, p. 48.

[239] http://www.sec.gov/Archives/edgar/data/709519/000119312509183969/dex992.htm; http://www.nytimes.com/2008/10/31/technology/companies/31sun.html.

[240] http://www.forbes.com/2008/10/20/sun-earnings-loss-tech-enter-cx_ag_1020sun.html; http://www.eweek.com/c/a/IT-Infrastructure/Sun-Microsystems-Fujitsu-Rolling-out-New-SPARCbased-Server-System; http://www.cnbc.com/id/32653203; http://www.nbcnews.com/id/27716152/ns/business-us_business/t/sun-microsystems-cut-workers/#.VqVrH_krLIU.

[241] http://www.nbcnews.com/id/27716152/ns/business-us_business/t/sun-microsystems-cut-workers/#.VqVrH_krLIU.

[242] Sun Microsystems, 2009 Annual Report, June 30, 2009, p. 6.

[243] "Boom in the Bust," March 5, 2009, www.economist.com/node/13234981.

[244] "Smartphone sales buck the recession," March 26, 2009, Infonetics Research, http://www.infonetics.com/pr/2009/2h08-mobile-wifi-phones-market-research-highlights.asp

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- Online research company Mobile Marketer, a self-proclaimed news leader in mobile marketing, media and commerce stated: *"While the failing economy has started to hit hard on the wireless data ecosystem, especially the infrastructure and handsets segments, consumers haven't really pulled back on mobile data spending overall, just yet."*[245]

195. As further evidence of the contrary nature of the mobile industry, the number of mobile device internet users grew 37.4 percent from 2011 to 2012.[246] Furthermore, as seen in the following Figure, the number of mobile connections continued to increase throughout the duration of the recession.

Figure 8

Historical Summary of Mobile Connections by Region [247]

196. Along with the growing number of internet capable devices and mobile connections, the corresponding number of data subscribers grew during the same time period. Despite the effects of the recession on consumer spending, from 2008 to 2014, the number of mobile data subscribers grew at a compound annual growth rate of 7.6 percent and "data access including flat rate data plan subscriptions has also shown significant strength." [248]

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[245] "Is Recession Positively Impacting the Wireless Industry," March 3, 2009, www.mobilemarketer.com.

[246] "Smartphone Users Worldwide Will Total 1.75 Billion in 2014," January 16, 2014, www.emarketer.com.

[247] "The Mobile Economy," 2015, GSMA, www.gsma.com.

[248] "The Mobile Economy," 2015, GSMA, www.gsma.com; "Is Recession Positively Impacting the Wireless Industry," March 3, 2009, http://www.mobilemarketer.com/cms/news/research/2748.print.

[249] OAGOOGLE0000491596-643 at 610.

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Figure 9

Growth in Mobile Data Usage During the 2008 – 2009 Time Period [250]
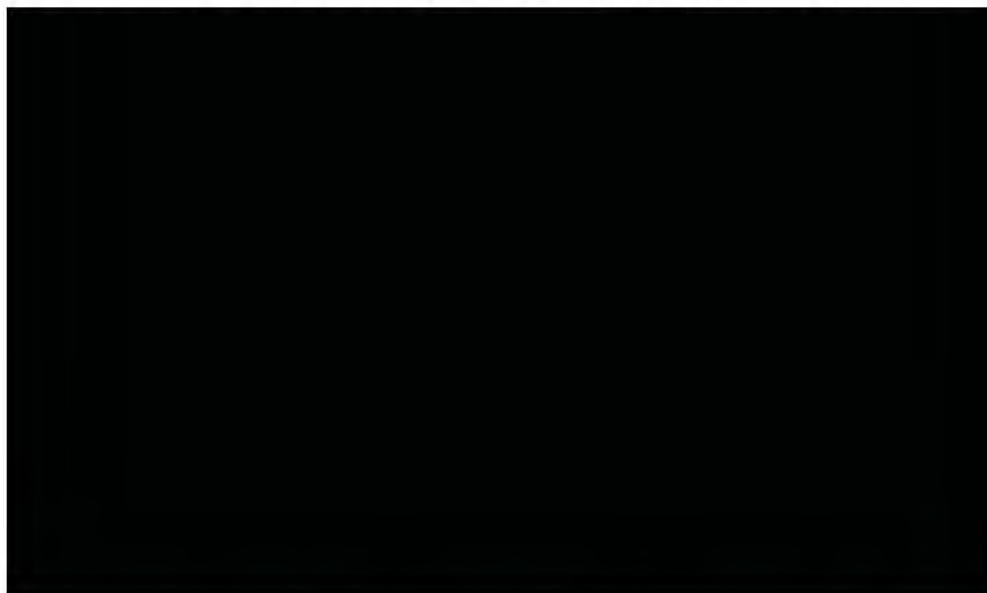
197.   In response to increases in mobile connectivity, developers were actively providing content and services to the expanding user base. As discussed previously, the number of Java developers increased to nine million in 2010 from six million in 2007 and the number of Java enabled phones grew from 2.6 billion in 2009 to over 3 billion in 2010. This growth occurred throughout the recession.

198.   At the time of the recession, Sun was more concerned about the impact of Android than the impact of the declining economic environment. ████████████████████████
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[250] OAGOOGLE0000491596-643 at 610.
[251] OAGOOGLE0000401814-817 at 816.
[252] OAGOOGLE0000401814-817 at 816.
[253] OAGOOGLE0000725014.

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199.   Finally, I note that, following Oracle's acquisition of Sun, which was announced 2009 and closed in 2010, Mr. Larry Ellison confirmed the value of Java, despite the ongoing financial crisis, when he stated Java is "the single most important software asset we have ever acquired."[254]

5.6   Sun's Dominance of the Feature Phone Market

200.   The decline in Java ME licensing revenue was not a result of the increase in smartphones, as Dr. Leonard suggests.   At the time of Google's first infringement, feature phones dominated the international market and Java was enabled on the majority of such devices.   Additionally, there was not a specific distinction between feature and smart phones, ███████████████████████ ███████████

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201.   And Java ME licenses specified "mobile devices" as fields of use and did not distinguish between feature phones and smart phones. ████████████████████████
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[254] "'Oracle Snatches Sun, Foiling IBM,' April 21, 2009, The Wall Street Journal," http://www.wsj.com/articles/SB124022726514434703.
[255] Deposition of Alan Brenner, December 15, 2015, pp. 67-68.
[256] OAGOOGLE2000181111 at 136.

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202. Cost and the availability of stable data connections and power sources drive consumer preferences for feature phones, which remain prevalent in countries such as India and China where consumers demand phones that provide mobile internet access.[257] Over time, feature phones have provided for enhanced functionality and, by way of example, "It wasn't long ago that only about 2% of all feature phones could access the web. Now that figure is more like 25%... In other words, billions of people the world over are going to start accessing the web through their feature phones."[258]

203. ████████████████████████████ As late as July 23, 2013:

> *The biggest opportunity right now isn't in smartphones, where users are bombarded by the fruits of and ever more competitive market for apps and mobile services. Rather, the play for some companies, especially any that wish to expand into emerging markets, is on the 'dumbphones' – aka non smartphones, or in industry parlance, feature phones – that most people in rich countries have now left behind.*[260]

204. Facebook's actions in 2013 were also consistent with strong demand for feature phones. This is evidenced by its <u>Facebook for Every Phone</u> program which "allows people with data plans on their feature phones to have smartphone-like experiences while using Facebook – meaning they get images, updates, chat, the whole thing."[261]

205. Even if the shift to smartphones had an impact on Java ME, the shift was accelerated through Google's release of Android. Google's infringement and release of Android for free accelerated the move of Java's customers to smartphones and have had a detrimental impact on Oracle's business. Dr. Leonard ignores that the very circumstances he points to were often caused by Google's infringement.

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[257] "Why did everyone abandon the feature phone market?" April 1, 2014, Emerging UX, http://emergingux.com/why-did-everyone-abandon-the-feature-phone-market/.

[258] "The biggest opportunity in mobile right now isn't on smartphones," July 23, 2013, Quartz, http://qz.com/106979/the-biggest-opportunity-in-mobile-right-now-isnt-on-smartphones/.

[259] Deposition of Alan Brenner, December 15, 2015, pp. 150-152.

[260] "The biggest opportunity in mobile right now isn't on smartphones," July 23, 2013, Quartz, http://qz.com/106979/the-biggest-opportunity-in-mobile-right-now-isnt-on-smartphones/.

[261] "The biggest opportunity in mobile right now isn't on smartphones," July 23, 2013, Quartz, http://qz.com/106979/the-biggest-opportunity-in-mobile-right-now-isnt-on-smartphones/.

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5.7   Sun's Ability to Transition Into the Smartphone Market

206.   Dr. Leonard wrongly asserts that Sun's smartphone operating system plans were terminated prior to the launch of Android and thus Android did not cause lost profits.[262] Dr. Leonard's opinion that Oracle's failure to build a smartphone operating system is due to factors other than Android overlooks the impact that Android had on Oracle's decision not to continue with Sun's plans to develop a smartphone operating system.[263] For example, Larry Ellison testified ███████████

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207.   Aside from Java's feature phone market dominance, certain smartphones were also Java-enabled. For example, Sun licensed the Java platform for use in all Blackberry smartphones and the Nokia Communicator and Series 60 devices, which were not only considered smartphones but, at the time, were some of (if not the) most advanced devices on the market. ████████████████

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208.   As seen in the following Figure, shipments of smartphones first exceed feature phones in 2015, almost 10 years after Google's first use of the Infringed Java Copyrights. This shift was in part due to Google's Android, as it provided a lower cost option to the smartphone market: "The surge in new smartphone users will also create a stage where cheap phones using Firefox OS could begin to gain a foothold in South America, with the vast majority of the rest upgrading from feature phones in developing countries expected to buy an Android phone."[267]

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[262] Expert Report of Dr. Leonard, February 8, 2016, p. 130; OAGOOGLE0007622843-845 at 843.

[263] Expert Report of Dr. Leonard, February 8, 2016, p. 132.

[264] Deposition of Larry Ellison, August 12, 2011, pp. 63-64.
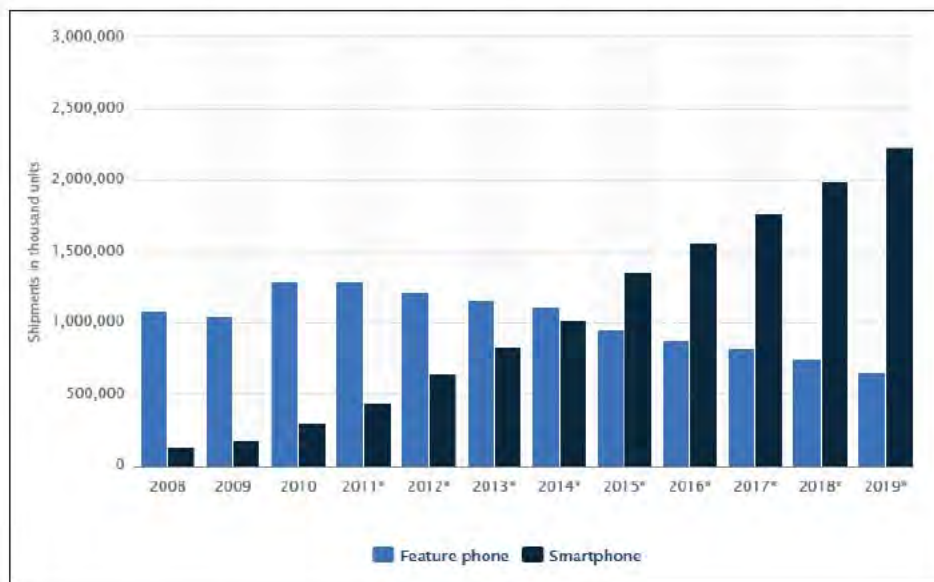
[265] Deposition of Alan Brenner, December 15, 2015, p. 151.

[266] Deposition of Alan Brenner, December 15, 2015, pp. 147-149.

[267] http://www.theguardian.com/technology/2014/jan/13/smartphone-explosion-2014-india-us-china-firefoxos-android.

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Figure 10

Summary of Historical Feature Phone and Smartphone Worldwide Shipments [268]

209. A major reason feature phones remained a large portion of the market is due to their relatively low cost. Therefore, given Sun's dominance in the feature phone market, it was well positioned to capitalize on the opportunity which existed to transition feature phone uses to smartphones, absent Google's infringement.

210. Sun was well aware of the evolving mobile phone market. ███████████████

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211. ████████████████████████████████████

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[268] "Feature phone and smartphone shipments worldwide from 2008 – 2020," The Statistics Portal, www.statista.com.
[269] OAGOOGLE0013331514 –564 at 531; OAGOOGLE0004936380-436 at 4non-.
[270] OAGOOGLE0000337463; OAGOOGLE0002304235; OAGOOGLE0002304236 – 243 at 237; 242 – 243; OAGOOGLE0000361417 – 418 at 417; OAGOOGLE0001700059 – 061 at 061.
[271] OAGOOGLE0004936380-436 at 428.

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[redacted] [272]

212. [redacted]

[redacted] The momentum Sun expected to capitalize on is expressed in the following Figure:

Figure 11

Sun Presentation Reflecting Java Penetration [281]

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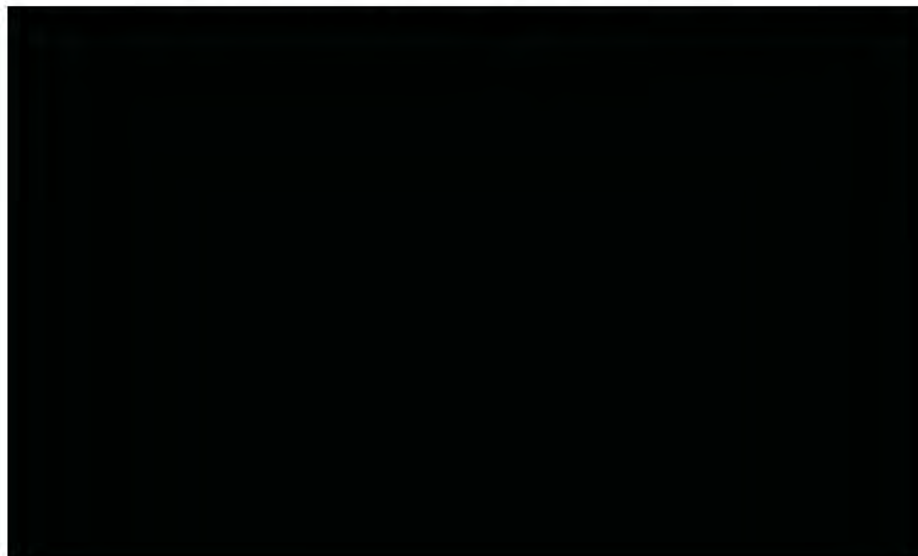
[272] OAGOOGLE0011726508-539 at 514 -516.
[273] OAGOOGLE0013561757-786 at 783.
[274] OAGOOGLE0004950038-63 at 39.
[275] OAGOOGLE0004950038-63 at 54.
[276] OAGOOGLE0005117411-419 at 412.
[277] OAGOOGLE0005117411-419 at 413.
[278] OAGOOGLE0004936380-436 at 401.
[279] OAGOOGLE0005117411-419 at 419.
[280] OAGOOGLE0004936380-436 at 410.
[281] OAGOOGLE0004950038-63 at 41.

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213. As discussed in my Initial Report, ████████████████████████████
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███████████████████████████████████ To that point,
Google also understood the value Java provided with respect to the transition from feature phones
to smartphones, as evidenced by an August 2007 internal Google email which states: "I can tell you
there are tens of thousands of Java developers who just can't wait to write mobile applications."[284]

214. ███
███████████████████████████████ █ ████████████
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██."[286]

215. █████████████████████████████████████
███
██████████████████████████████."[287]

5.8   Nokia's Role in Sun's Expansion Into the Smartphone Market

216. Sun's opportunity to obtain significant smartphone market share was in part due to its relationships
in the industry. I understand that Nokia had 48 percent of the mobile device market share in
2006.[288] According to the Bloomberg Research "2006 was the year of the converged device with
80 million smart phones shipped worldwide, according to analysts – and Nokia remains the
unequivocal leader selling almost one in two smart mobiles."[289] RIM was Nokia's nearest
competitor, with six million phones and 7.5 percent of the market.[290] Given Java was enabled on

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[282] OAGOOGLE0001872552 –555 at 552.

[283] OAGOOGLE0019801560-587 at 565-566.

[284] GOOGLE-01-00029331-332 at 331; Trial Exhibit 387.

[285] OAGOOGLE0002778854-882 at 869.

[286] OAGOOGLE0002778854-882 at 882. RTOS refers to run-time OS which was commonly used in feature phones
and tended to be proprietary; see for example, http://www.visionmobile.com/blog/2009/07/feature-phones-and-
the-rtos-the-ignored-85-of-the-market/.

[287] OAGOOGLE0005039944 –962 at 947.

[288] http://www.bloomberg.com/bw/stories/2007-02-27/nokia-tops-in-2006-smartphone-salesbusinessweek-business-
news-stock-market-and-financial-advice.

[289] http://www.bloomberg.com/bw/stories/2007-02-27/nokia-tops-in-2006-smartphone-salesbusinessweek-business-
news-stock-market-and-financial-advice.

[290] http://www.bloomberg.com/bw/stories/2007-02-27/nokia-tops-in-2006-smartphone-salesbusinessweek-business-
news-stock-market-and-financial-advice.

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the majority of these phones and Sun had relationships with both Nokia and RIM, it was well positioned to capitalize on the transition from feature phones to smartphones.

217.   Throughout the unique window of opportunity, Sun and Nokia continued to address a changing market.   Nokia recognized this opportunity as early as 2005, noting: "Mobile communications is converging in some areas with computing, digital imaging, and the internet, making it possible for consumers to use handheld devices for filming video, listening to music, playing games, surfing the web, and more.   Nokia is shaping this converging industry, pushing it forward with cutting-edge products and the development of open standards."[291]

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██[92]

218.   Expectations for Nokia and Sun did not change until after Google shopped Android around privately to OEMs and carriers before publicly releasing Android in 2008, as reflected by the fact that, as late as 2007, "Nokia continue[d] to target an increase in its market share in mobile devices"[293]   Also, around that time, Nokia specifically identified competition and unlawful use of its intellectual property as a risk factors for its mobile device market share:

> *Competition in the industry is intense.   Our failure to maintain or improve our market position and respond successfully to changes in the competitive landscape may have a material adverse impact on our business and results of operations.[294]*
>
> :::
>
> *Our products and solutions include numerous new Nokia patented, standardized, or proprietary technologies on which we depend.   Third parties may use without a license or unlawfully infringe our intellectual property or commence actions seeking to establish the invalidity of the intellectual property rights of these technologies.   This may have a material adverse effect on our results of operations.[295]*

219.   ██[296] █

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[291] Nokia 2005 Corporate Responsibility Report, p. 25
(http://company.nokia.com/sites/default/files/download/nokia-cr-report-2005-pdf.pdf).
[292] OAGOOGLE0019801560-19801587 at 1565.
[293] Nokia 2006 Annual Report, p. 6 (https://bib.kuleuven.be/files/ebib/jaarverslagen/NOKIA_2006.pdf).
[294] Nokia 2006 Annual Report, p. 6 (https://bib.kuleuven.be/files/ebib/jaarverslagen/NOKIA_2006.pdf).
[295] Nokia 2006 Annual Report, p. 6 (https://bib.kuleuven.be/files/ebib/jaarverslagen/NOKIA_2006.pdf).
[296] Deposition of Alan Brenner, December 15, 2015, p. 151.
[297] Deposition of Alan Brenner, December 15, 2015, pp. 227-234.

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[redacted]

220.   [redacted]

221.   [redacted].[305]

Around the time of Google's first infringement, Nokia was a leading brand in the mobile phone market, as evidenced by a 2005 Interbrand survey which identified Nokia as the world's sixth most valued brand.[306] Also in 2005, a Top 100 Brands list included Nokia at number 6 and Google at 38.[307] However, today Google has surpassed Nokia in terms of brand value, no doubt due (at least in part) to Android.

5.9   Sun/Oracle Investment in Java ME

222.   Dr. Leonard has also opined that a lack of investment in Java ME was a cause of its revenue decline.[308] However, Dr. Leonard's analyses and related opinions inappropriately rely on sources of information dated long after Android was first introduced in 2009.[309]

223.   As support for his opinion that a lack of investment caused the decline in Java ME revenue, Dr. Leonard references deposition testimony that, in 2013 Oracle decided "not to focus on making a

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[298] Deposition of Alan Brenner, December 15, 2015, pp. 230-231.
[299] Deposition of Alan Brenner, December 15, 2015, pp. 230-231.
[300] Deposition of Alan Brenner, December 15, 2015, pp. 233-236.
[301] OAGOOGLE2000181111-146 at 128
[302] OAGOOGLE2000181111-146 at 136
[303] Deposition of Vineet Gupta, July 26, 2011, pp. 280-282.
[304] OAGOOGLE0000457797-801 at 797.
[305] OAGOOGLE0002778854- 2778882 at 869.
[306] "Nokia 2005 Corporate Responsibility Report," http://company.nokia.com/sites/default/files/download/nokia-cr-report-2005-pdf.pdf, p. 24.
[307] http://www.businessweek.com/pdfs/2005/0531_globalbrand.pdf
[308] Expert Report of Dr. Leonard, February 8, 2016, p. 116.
[309] Expert Report of Dr. Leonard, February 8, 2016, pp. 116-119.

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new major version of Java ME update, targeting the phone business, because we didn't believe that we would get a net option for it, basically."[310] Similarly, Dr. Leonard relies on deposition testimony that around April 2012, Java ME was an "old technology stack" and "if you wanted to continue to use and license Java ME and, in particular, to be able to compete with something like Android, you would have to make significant investments in it."[311] Not only do these decisions made by Oracle more than five years after Google began using the Infringed Java Copyrights not support Dr. Leonard's opinions, they are consistent with (and provide support for) my opinion that Oracle was forced to alter expectations and plans for Java ME following Google's infringement.

224. That said, I note that Sun continued to invest in Java ME prior to and overlapping with the early stages of Android. According to a March 2009 Sun presentation, Sun estimated it would invest 49 percent of its anticipated Java wireless revenue on Research & Development (R&D).[312] In this same presentation, Sun compared its Java related Research & Development investment to its "peers" that only invested 14 to 21 percent of total revenue.[313] This illustrates that Sun continued to make relatively significant R&D investments in Java throughout at least 2009.[314]

6.   RESPONSE TO DR. LEONARD'S TECHNICAL OPINIONS

6.1   Dr. Leonard Improperly Offers Many Technical Opinions

225. Dr. Leonard has independently offered many technical opinions for which he cites to no supporting technical evidence and/or opinions. Listed below are several examples of such opinions from Dr. Leonard:

- Google's contribution to the Android platform including the Linux kernel, Hardware Abstraction Layer, native libraries, core libraries, the Android framework, Android Run Time and Applications Layer;[315]

- The potential effects of 'familiarity' with the 37 Java APIs were small at best;[316]

- Even if the 37 Java APIs were 'stable' in and of themselves, their use would in no sense guarantee stability of Android as a whole;[317]

- Any 'stability' that Java might have is not unique to Java;[318]

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[310] Expert Report of Dr. Leonard, February 8, 2016, p. 117.
[311] Expert Report of Dr. Leonard, February 8, 2016, pp. 117-118.
[312] Trial Exhibit 560, OAGOOGLE0003388109-138 at 115.
[313] Trial Exhibit 560, OAGOOGLE0003388109-138 at 115.
[314] Trial Exhibit 560, OAGOOGLE0003388109-138 at 115.
[315] Expert Report of Dr. Leonard, February 8, 2016, pp 35-39.
[316] Expert Report of Dr. Leonard, February 8, 2016, p. 46.
[317] Expert Report of Dr. Leonard, February 8, 2016, p. 47.
[318] Expert Report of Dr. Leonard, February 8, 2016, p. 47.

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- Any advantage Java offered over these other languages was small and also accompanied by disadvantages.[319]

226. Dr. Leonard draws inappropriate and unqualified opinions about these (and other) technical topics as they relate to damages. In connection with offering these opinions, Dr. Leonard does not cite to any qualified technical opinion from a Google technical expert (or any other reliable source), and thus the conclusions he draws from such technical opinions are unsupported and unreliable.

6.2   Dr. Leonard's Technical Opinions Are Unreliable

227. Based on my discussions with Oracle's technical experts and my review of their expert reports, I understand each of the following technical opinions put forth by Dr. Leonard is unreliable.

6.2.1   Dr. Leonard's View Regarding Reasons for the Success of Android – Other Than the Alleged Infringement

228. Dr. Leonard cites reasons for the success of Android other than the infringement of the 37 Java APIs including Google's efforts, Google's decisions to make Android free and open source, and the efforts of OEMs.[320]

229. I understand that Dr. Schmidt has addressed this issue by investigating and determining that "Android is not usable on a computing device, such as a phone or tablet, without each of the Java API packages at issue or the copied declaring code in them."[321] Therefore, without use of the Infringed Java Copyrights, the additional efforts of Google, and the efforts of the OEMs would be moot since Android would not be functional without them.

230. Dr. Leonard states that "Google has provided ways for developers to write applications in programming languages other than Java… the Native Development Kit (NDK) allows a developer to write an Android application in C or C++"[322]

231. I understand that contrary to Dr. Leonard's opinion, Google has acknowledged that generally there is no performance increase in using the NDK and advises that "[b]efore downloading the NDK, you should understand that the NDK will not benefit most apps...Notably, using native code on Android generally does not result in a noticeable performance improvement, but it always increases your app complexity. In general, you should only use the NDK if it is essential to your app – never because you simply prefer to program in C/C++."[323]

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[319] Expert Report of Dr. Leonard, February 8, 2016, p. 48.
[320] Expert Report of Dr. Leonard, February 8, 2016, pp. 34-46.
[321] Expert Report of Dr. Schmidt, Jan 8, 2016, ¶ 78.
[322] Expert Report of Dr. Leonard, February 8, 2016, ¶ 76.
[323] http://developer.android.com/tools/sdk/ndk/index.html.

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232. Due to the fact that the initial NDK was available in 2009[324], the NDK would not have been available to developers from 2008 to 2009. Thus, despite Dr. Leonard's assertions that alternatives to Java existed and developers had the option of choosing multiple programming languages, this was simply not the case - as support for other programming languages did not initially exist. Later, while the use of Java was encouraged, C++ became supported, but its use was discouraged by Google.[325]

233. Dr. Leonard states that, "Google contributed many popular Android applications that were important for getting the Android ecosystem off the ground... pre-loaded on many Android devices, including Google Maps, Gmail, YouTube and Google Play."[326] I understand from Dr. Kemerer's analysis, "Android and its 'top apps' have a high dependency on the 37 Java APIs."[327] Thus, Dr. Leonard's statements regarding Google's contribution could not have occurred without the Infringed Java Copyrights, which were an integral piece of the Google Mobile Services applications that Dr. Leonard refers to.[328]

234. I understand that Dr. Kemerer refers to centrality as "a metric that is used to describe the relative importance of a particular entity, or node, within a network of interconnected entities"[329] and that Dr. Kemerer has found that the centrality of the copied code is 9.06 times greater than non-copied code. I understand that this analysis indicates "the classes Google copied are of consistently high centrality to the Java SE platform."[330]

235. Dr. Leonard does not appear to rely on any empirical evidence that the Linux Kernel, Android Runtime, Hardware abstraction layer and other components of the Android platform contribute to Android's success. I understand the only empirical evidence in the case is from Dr. Kemerer and Dr. Schmidt and they have demonstrated that the 37 APIs are central to the success of the platform. The relative contribution of the other components cited by Dr. Leonard have not been attributed to any technical analysis for support.

6.2.2   Dr. Leonard's View Regarding 37 APIs Valued Equally to Other Android APIs

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[324] http://android-developers.blogspot.com/2009/06/introducing-android-15-ndk-release-1.html; http://developer.android.com/ndk/downloads/revision_history.html; http://android-developers.blogspot.com/2009/06/introducing-android-15-ndk-release-1.html

[325] http://developer.android.com/tools/sdk/ndk/index.html

[326] Expert Report of Dr. Leonard, February 8, 2016, ¶ 79.

[327] Expert Report of Dr. Kemerer, January 8, 2016, ¶ 160.

[328] Expert Report of Dr. Leonard, February 8, 2016, ¶ 79.

[329] Expert Report of Dr. Kemerer, February 8, 2016, ¶ 28.

[330] Expert Report of Dr. Kemerer, February 8, 2016, ¶ 41.

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236. Dr. Leonard claims "the 37 Java APIs at issue constitute only a small portion of the overall Android code base,"[331] and his "top-down" apportionment analysis implicitly assumes equal weighting of the Infringed Java Copyrights relative to other aspects of the Android platform.

237. I understand Dr. Kemerer has performed stability and centrality analyses to determine the relative importance of the 37 Java API packages to the Android platform. I also understand he has found that "the 37 Java APIs are highly central within the Android platform compared to the non-copied APIs and, thus, Google copied a substantial portion of the Java SE platform."[332] I also understand that Dr. Kemerer found that the 37 Java APIs contributed to stability of the Android platform and the 37 Java APIs are also important to many popular apps.[333]

238. Also, as discussed previously in Section 6, I also understand that the 37 Java APIs contribute greater value to Android than other aspects of the Android platform.

6.2.3   Dr. Leonard's View Regarding Minimal Advantages of Java – Other Programming Languages Were Considered

239. Dr. Leonard has asserted that Google could have chosen to use one of many other existing applications programming languages and "[a]ny advantage Java offered over these other languages was small and also accompanied by disadvantages."[334]

240. I understand that Google chose to base the Android platform on the 37 Java APIs because of the Java platform's key attributes, as explained by Dr. Schmidt.[335] Some of these attributes include the popularity of the Java platform, as well as the many tools "available for writing, refactoring, debugging, optimizing, and deploying Java applications."[336] I also understand that other existing applications programming languages did not offer these key attributes, and thus Dr. Leonard's statement that "Google could have chosen to use one of many other existing applications programming languages"[337] is without basis and empirical support.

241. I also note the previously discussed Court order confirming that consideration of non-infringing alternatives for the purpose of evaluating wrongful profit is improper. As Dr. Leonard is now taking a similar position regarding non-infringing alternatives, it is equally irrelevant. That being said, I understand there were other options that had the key benefits of the Java platform available to Google for the reasons discussed in Dr. Schmidt's expert report. Dr. Schmidt explains that

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[331] Expert Report of Dr. Leonard, February 8, 2016, p. 47.

[332] Expert Report of Dr. Kemerer, January 8, 2016, section VI(c); February 8, 2016 report, section VI(B).

[333] Expert Report of Dr. Kemerer, January 8, 2016, section VI(b) and p.39-41; February 29, 2016 report, sections IV, V.

[334] Expert Report of Dr. Leonard, February 8, 2016, ¶ 100.

[335] Expert Report of Dr. Schmidt, January 8, 2016, p. 31.

[336] Expert Report of Dr. Schmidt, January 8, 2016, p. 31.

[337] Expert Report of Dr. Leonard, ¶ 100.

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"while a number of different language platforms offered useful features in the mid-2000s, none combined the value of an app developer friendly platform with published specifications intended to ensure compatibility that was widely adopted by a large number of app developers."[338] Dr. Schmidt further explains the drawbacks and deficiencies of numerous platforms that Google considered and declined to implement in favor of the Java platform.[339] Thus, the Java platform including the 37 Java APIs was the best option available to Google and all of Dr. Leonard's unsupported statements directed to the minimal advantages associated with the Java platform are incorrect and unreliable.[340]

6.2.4   Dr. Leonard's View Regarding Lack of Importance of Java Developers Familiarity with Android

242.   Dr. Leonard states that "economic evidence demonstrates that these potential effects of "familiarity" with the 37 Java API packages were small at best, which would mean that the contribution of the alleged infringement to Android-related profits was small as well."[341]

243.   I understand that Dr. Schmidt explained that, for developers, "writing code in general, and reusable APIs in particular, is a time consuming and highly creative effort that requires considerable resources and creative effort."[342] I also understand from Dr. Kemerer that "Google benefited from using the copied code and the structure, sequence and organization of the 37 Java API packages to leverage their popularity and familiarity among developers in order to quickly attract developers to the Android platform when it was first created."[343]

244.   I also understand that Daniel Bornstein, the key architect of the Dalvik virtual machine was asked "[w]hy did the Android team select Java to be the main language for Android" and he explained that "there was a good open source community around developers that use the Java programming language. There were good tools, such as Eclipse, that were other open source tools that worked with that programming language. There were already a number of good open source libraries written in the programming language. I think all of these things were – I guess I would consider all of those things to be sort of, so to speak, in favor."[344]

245.   I understand that Dr. Schmidt described many of the key attributes of the Java platform including enhanced programmer productivity, increased app security, and efficient garbage collection for memory management in order to build more efficient applications.[345] Since none of the other

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[338] Expert Report of Dr. Schmidt, February 29, 2016, ¶ 43.
[339] Expert Report of Dr. Schmidt, February 29, 2016, pp 19-21.
[340] Expert Report of Dr. Schmidt, February 29, 2016, Sections VI(B) and (C).
[341] Expert Report of Dr. Leonard, ¶ 97.
[342] Expert Report of Dr. Schmidt, February 8, 2016, ¶ 194.
[343] Expert Report of Dr. Kemerer, February 8, 2016, ¶ 108.
[344] Deposition of Daniel Bornstein, May 16, 2011, pp 48-49.
[345] Expert Report of Dr. Schmidt, February 29, 2016, ¶ 33.

platforms available to Google at the time had these advantages, the importance of attracting Java developers to the Android platform was a significant motivating factor for Google to adopt Java and it was necessary for Google to copy the 37 Java APIs in order to so.

246.   Google was faced with the option of adopting a different platform, which it was not able to for the reasons explained above, or creating its own set of APIs to function in the same way as the 37 Java APIs. As Dr. Schmidt indicated, developing an independent platform would have involved "time, effort and technical risk"[346] and due to Google's time pressures it was not in a position to develop anything similar internally in the time window that it faced. Thus, it is clear that Java was the only option that Google had in order to attract developers to the Android platform.

6.2.5   Dr. Leonard's View Regarding the Ease with Which Programmers Move from one Language to the Next

247.   Dr. Leonard states that "it would have been as easy for an applications developer who had written an iPhone application in Objective C to port that application to C/C++ for use in Android as it was to port it to or write it from scratch in the Java programming language."[347] He also opines that "[p]rogrammers familiar with one language typically find it relatively easy to pick up other languages."[348]

248.   As discussed previously, although a skilled programmer is likely familiar with multiple programming languages, in order to build a robust mobile application in multiple programming environments that will remain stable for increasing number of users, such as the Facebook or Yelp applications, it would require significant additional time and effort. Although programmers may be trained in multiple languages, Dr. Leonard conflates the ability of a programmer to code in multiple languages with a programmer's ease of accurately and effectively developing robust commercial applications in multiple programming languages.

249.   At Google I/O in May 2011, Google announced that there were 450,000 Android developers around the world.[349] It is unlikely that the number of Android developers would have been significant if a new programming language was required to learn in order to develop for the new platform. In February 2015, Intel mentioned "millions of Android developers are dedicated to building stable and scalable applications."[350] As of 2014, Android was catching up to iOS in terms of developer preference and there is considerable overlap in terms of how developers classified their primary and secondary platform preferences.[351,352] Therefore, I understand that programming

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[346] Expert Report of Dr. Schmidt, February 29, 2016, ¶ 36.

[347] Expert Report of Dr. Leonard, February 8, 2016 ¶ 106.

[348] Expert Report of Dr. Leonard, February 8, 2016 ¶ 107.

[349] http://www.cnet.com/news/google-amps-up-the-media-experience-live-blog/.

[350] https://software.intel.com/en-us/android/articles/tips-for-optimizing-android-application-memory-usage.

[351] http://readwrite.com/2014/01/14/tablet-developers-now-target-android-but-wheres-the-money.

[352] http://www.developereconomics.com/report/q3-2013-the-multi-platform-developer/.

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languages are not interchangeable and it is a non-trivial task to learn a new language and program proficiently in it, otherwise there would not be a distinction between preferences for platform languages.

6.2.6 Dr. Leonard's View Regarding Stability of Java v. Stagnation

250. Dr. Leonard states that "Sun's Java platform (and its APIs) did not change not because of "stability", but because Sun stopped innovating. Stagnation (lack of innovation) is not a positive and, in fact, this stagnation explains why Java's popularity was declining prior to the introduction of Android."[353]

251. I understand that Dr. Leonard's view regarding the stagnation of Java is factually incorrect. All of the 37 Java APIs at issue have been a core part of the Java platform since at least September 2004, and I understand that some portion of the 37 Java APIs have been a core part of the Java platform since its earliest releases.[354] I understand that the 37 Java APIs have enabled additional functionality to be built on top of them and that the 37 Java APIs are routinely called by other APIs within the platform.[355] Java had an established ecosystem which included the following attributes enumerated by Dr. Jaffe: widespread acceptance among vital platform partners like OEMs and wireless carriers; a familiar, well-tested applications platform that ran predictably, a stable, educated deep-rooted developer community; and the ability to reach the market faster with a technically stable, lower-risk commercially successful product.[356]

252. I understand that Dr. Kemerer conducted "an analysis of the importance of the 37 Java APIs to the Android platform by assessing the degree to which they contributed to the stability of the Android platform." In connection with preparing that analysis, I understand he considered "the relative changes in the method declarations of the 37 Java APIs copied in Android, as compared to other APIs in the Android core libraries and frameworks" and found "[T]here is much less change and thus much greater stability of the 37 Java APIs, compared to other APIs in Android."[357] I understand that since the 37 Java APIs were more stable than the rest of the APIs in Android, the stability of the 37 Java APIs would necessarily provide more stability to the Android platform, contrary to what Dr. Leonard states. These 37 Java APIs did not change, not because of stagnation, but because they were optimized for efficiency and did not require further changes.

253. Therefore, I understand that the Java platform was not stagnant in any sense, but provided a stable platform that served as the basis on which Google, BlackBerry, Amazon and other companies built

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[353] Expert Report of Dr. Leonard, February 8, 2016, p. 47.

[354] Expert Report of Dr. Kemerer, January 8, 2016, p. 3

[355] Expert Report of Dr. Kemerer, January 8, 2016, ¶ 51; Expert Report of Dr. Schmidt, February 8, 2016, ¶¶ 233 and 237.

[356] Expert Report of Dr. Jaffe, February 8, 2016, ¶ 161; Expert Report of Dr. Kemerer, February 8, 2016, ¶ 103.

[357] Expert Report of Dr. Kemerer, February 8, 2016, ¶ 55.

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reliable large-scale commercial products. I note that this issue is also addressed in my response to Dr. Leonard's lost profit opinions.

6.2.7   Dr. Leonard's View that iPhone Success Shows Familiarity of Platform not Indicator of Success

254. Dr. Leonard claims that "despite the lower levels of familiarity with Objective C, there has been an explosion in applications developed for the iPhone. This shows that developers are willing and able to respond to market opportunities by adapting and learning to program in previously unfamiliar languages."[358]

255. As I discussed previously, I understand developer interest and acceptance in programming in Objective C is incentivized largely by the attractive developer revenue-sharing model that Apple provides for its developers, and not because developers prefer a lesser known language like Objective C over a widely known language like Java. I also understand this is not an indication that programmers are less inclined to using a familiar language, rather this is an indication that the financial incentives for developers to recoup their costs by developing on the iOS platform are higher. Dr. Leonard appears to reach an incorrect conclusion on the success of a smartphone platform by basing it solely on the developer revenue sharing model of a digital distribution platform.

256. Dr. Leonard uses reductive logic to minimize the importance of the Java platform, but he fails to address the fact that, if Android had not chosen the Java platform for use in Android, there would not have been an ecosystem of OEMs, carriers, and developers for Google to monetize. The Java ecosystem of OEMs, carriers, and developers was already in place and by using the Java platform for the Android platform, Google could readily go to market and not be far behind Apple. Simply implementing a different programming language overlooks all of the related features of a platforms' success.

257. Moreover, Dr. Leonard fails to consider other aspects of these mobile platforms that would factor into developer choice. For example, some developers prefer to develop first for iOS because there is no fragmentation and there is consistency in hardware. iOS developers do not need to account for many different physical specifications across the same class of device, unlike Android developers. Additionally, in a tightly-controlled environment like iOS, developers can "get the details right" first and then port their apps over to Android.[359]

258.   Lastly, as seen below, some developers choose to develop for whatever platform is in a language that they are familiar with already.

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[358] Expert Report of Dr. Leonard, February 8, 2016 ¶ 117.
[359] http://tech.co/android-ios-development-2015-04.

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When Apple released the iPhone SDK in 2008, I had already been working with the Objective-C programming language for several years. Developing for iOS was very easy to explore. I bought some iOS programming books, but I already had enough knowledge to get started. Nowadays, I only need to consult API documentation. If I had found significant stumbling blocks with iOS, I could've made the decision to switch to another platform such as Android.[360]

6.2.8   Dr. Leonard's View that Blackberry's Lack of Success Shows that Java Platform is Not an Indicator of Success

259. Dr. Leonard states that, "despite having Java as an applications programming language and despite offering users many of the same most popular apps as Android, BlackBerry quickly lost out to the iPhone and Android handsets. This demonstrates the minor role that the particular choice of applications programming language plays in the success of a platform as compared to the features of the hardware, features of the operating system itself, and strategic choices of the vendor."[361] I find his analysis flawed for several reasons.

260. First, I understand that Dr. Kemerer found that "[o]ne of the contributing factors to this decline [of BlackBerry market share] was the relative dearth of BlackBerry apps measured against their competitors" and such industry examples "stress the important role of the app developer community in bolstering the health a mobile platform."[362] Thus, the selection of the Java platform for use in BlackBerry was actually not the reason for BlackBerry's competitive struggles; instead, it was the lack of available applications, among other market constraints. In addition, BlackBerry had been a successful Java-based platform in the late 1990s to mid-2000s and as of September 2008, BlackBerry had 50% of the smartphone market in the US.[363] Therefore, Dr. Leonard has failed to understand and accurately apply the issues that caused BlackBerry's recent lack of success, and incorrectly attributes BlackBerry's decline to Java, which is clearly not based on historical facts.

261. I understand the very choice to use the Java platform for Android is what allowed Android to achieve platform success in a short timeframe because, by doing so, Android was able to leverage the already existing ecosystem of OEMs, carriers, and developers that Sun had spent years cultivating around the Java platform.

262. Android emerged in 2008, when smartphone demand was beginning to come from consumers rather than enterprise customers. Consumers wanted phones that could do more than just communicate and enable productivity – they wanted phones that could entertain them.[364] Around the same time, the financial crisis decimated enterprise demand for high-end handsets. Macquarie Capital wrote in a 2009 equity research report: "we believe that the increasing willingness of

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[360] http://tech.co/android-ios-development-2015-04.

[361] Expert Report of Dr. Leonard, February 8, 2016 ¶ 121.

[362] Expert Report of Dr. Kemerer, February 9, 2016, ¶ 112.

[363] http://www.foxnews.com/story/2008/09/09/blackberry-maker-snags-half-us-smartphone-market.html.

[364] http://www.informationweek.com/smartphone-consumer-demand-growing/d/d-id/1090441.